YAESU FT-901/902DM
REPLACING HV ELECTROLYTIC CAPACITORS

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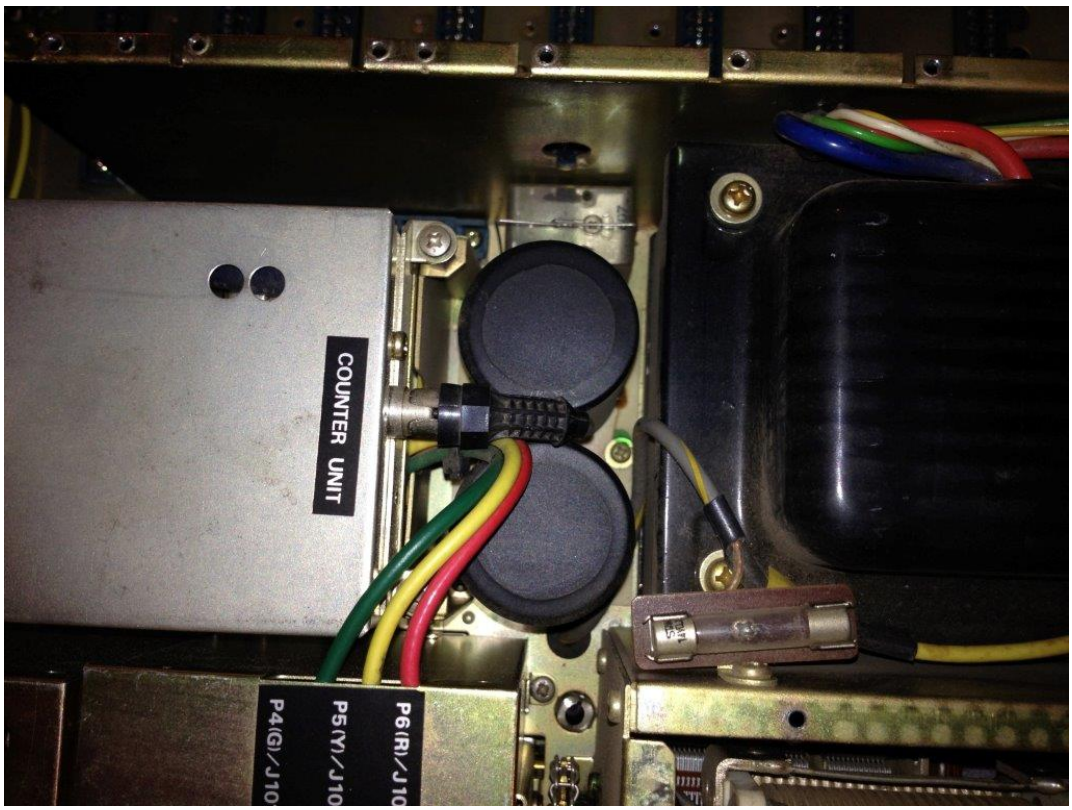
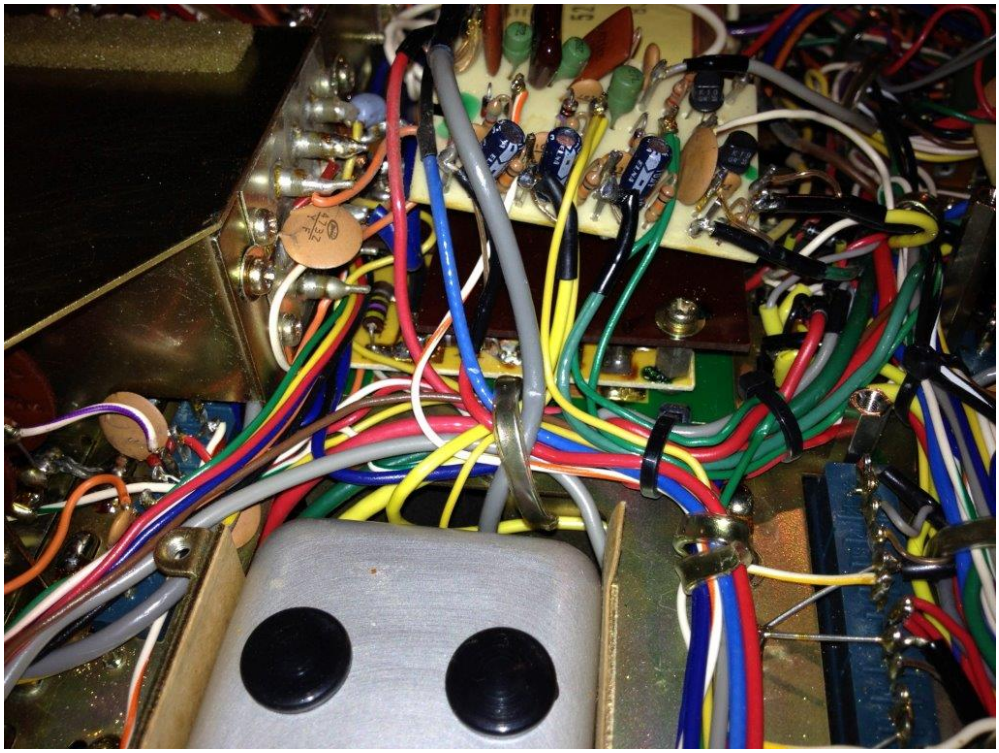
REFERENCES: FT-901/902DM Service and Operating Manuals

WARNING: ***You are working with components in the highest voltage (ca. 900VDC) part of the rig! Be SURE the HV caps are discharged by grounding before you start work***. Work carefully and double/triple check your connections on this somewhat complicated, stacked series of circuit boards.

Here are the original HV caps when viewed from the top of the chassis. Note that space is tight around them and you'll probably need to either loosen or remove the Counter Unit for the digital display and the RL-1 relay (just above the caps in this view) to make room. I also loosened and moved aside the colored coaxial feeds you see to the RF Unit and the black coax plug to the Counter Unit.



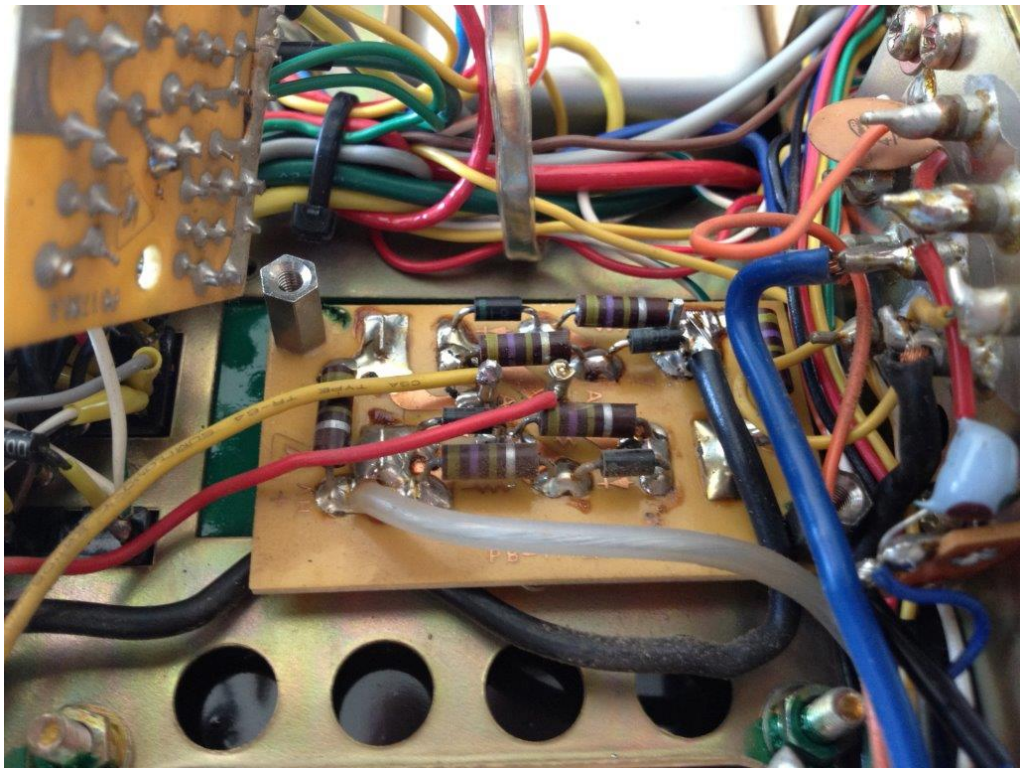
1. You'll need to remove the Memory and Crystal units underneath. They need to be out of the way, so unbolt them and carefully remove the Molex connectors to each. This reveals the bottom of the VFO and the Diode Switch board (below):



2. Loosen and roll the Diode Switch board (seen behind the VFO unit with various coax and wire inputs). Roll it toward the front of the radio. You can remove it, but I just flipped it out of the way and held it with a rubber band. There are a lot of soldered wires to deal with if you remove it.

3. There is a blank shield board (dark brown—Bakelite or similar) mounted under the Diode Switch board and over the Rectifier B board which you need to remove and set aside. You can see the yellow-colored Rectifier B board peeking out just below.

4. You can now see the HV Rectifier B board (below). This is attached by soldered connection to the four tabs of the HV caps, that are on the separate Capacitor board mounted to the chassis just below. De-solder and move aside the thick HV and ground wires and the smaller colored wires (keep track of where everything is connected—I recommend photos like these!). There is also a large blue wire tack soldered to a through connector beside the rectifier board that I found necessary to un-tack and move as well. TAKE NOTE OF THE SPACING BETWEEN THE CAPACITOR AND RECTIFIER B BOARDS at this point before you remove the Rectifier B board from the Capacitor board.



5. De-solder the four HV cap tabs on the Rectifier B board (clearly visible at the corners of the components). I used a de-soldering pump to get the tabs completely free of solder. Now you should be able to lift off the Rectifier B board, revealing the underside of the HV Capacitor board.

6. De-solder the tabs of the four HV caps from the Capacitor board in the same ways as above. Be sure they are clear of solder.

7. Turn the radio over. Take out the three screws holding the Capacitor board. Remove the old capacitors. Again, I found it easier to do the topside work if I first loosened the Counter unit so I could move it out of the way a bit. It was also easier if I removed the multi-function relay RL-1 (I used the opportunity to clean the contacts).

8. Get the caps off the board. Clean it up if there is any leakage/residue. You'll notice that these two original caps had significant bulges around the vent holes on the bottom and evidence of some leakage.

9. If your replacement caps are like the ones I could get, they are smaller in height and the same diameter as the originals and are the "snap in" types with shorter tabs. The physical size difference will not matter and the tabs are far enough apart that they should fit through the slots on the capacitor board. I used needle nose pliers to "un-twist" the tabs to go straight through the slots in the board. These are blue 150 uF 500V CDE caps that I ordered off the web as a "replacement kit" for the 901/902DM. In a second rig I re-capped, I used 100 uF Nichicon units from Mouser that were somewhat smaller in diameter (and cheaper), but had the same lead length and spacing as the blue 150 uF CDE units.

There are varying opinions on how much capacitance to use. These 150 uF units work fine and are advertised to "reduce power supply sag," but I suspect they were recommended because they are the same diameter as the originals. Nevertheless, you don't have to use more than the original 100 uF. The new 100 uF caps I used in the second rig are same rating as the old, large units but the modern electrolytics are just smaller.

10. You will notice that the tabs on the new electolytics are shorter than the old ones (below). **This is a problem** and they'll need to be as long as the originals to get the proper spacing between the capacitor board and the rectifier board. I soldered on pieces of stiff wire onto the new caps to extend the leads to the proper length, matching the length of the old tabs before mounting them on the Capacitor board.

11. Once the new leads are on, solder the caps to the capacitor board **making sure the polarity is correct**. Replace the assembled board onto the chassis. With three mounting screws, it should only go back in one way.

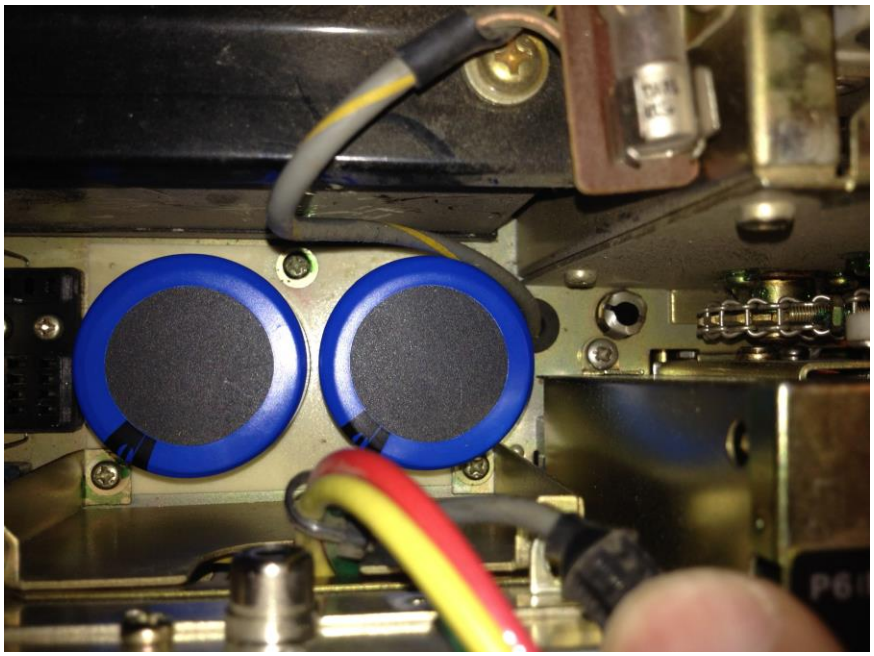
12. Turn the rig back over. I suggest you take the opportunity to check the bleeder/bridge resistors (all 470K) on the Rectifier B board. Replace as needed, but I always change the bleeders (R405 & 406) as they are usually bad/high after many years of cycling.

13. Place the Rectifier B board on the HV cap leads and carefully space the boards the correct distance apart that you determined above. NOTE: BE SURE TO PROPERLY ALIGN THE RECTIFIER B AND CAPACITOR BOARDS BEFORE SOLDERING, AS NOTED IN THE SERVICE MANUAL (Page 3-73). THE YAESU TRADEMARKS ON THE BOARDS SHOULD LINE UP FOR PROPER CONNECTION OF THE HV CAPS. Solder the two tabs first that don't have either of the large wires attached. Then re-solder the HV and ground wires and the two remaining tabs. The large wires are tacked onto the board next to the HV cap tabs. Make sure you get good, clean connections without excess solder. Re-solder the small wires as well.

14. Reverse the disassembly steps, making sure everything is reconnected properly. Be sure to re-connect the large blue wire! NOTE: you need to put the Crystal unit back in first, then the Memory unit as the last steps and re-connect the Molex connectors gently.

15. After carefully checking your work, you can fire it up without the tubes installed to check the basic integrity of the circuit and do some measurements. AGAIN, BE CAREFUL WORKING WITH THE HIGH VOLTAGES PRESENT!

INSTALLED 150 uF UNITS—TOP CHASSIS VIEW



INSTALLED 100 uF UNITS—TOP CHASSIS VIEW